

**ONTARIO PEST MANAGEMENT
RESEARCH & SERVICES COMMITTEE**

2001 ANNUAL REPORT

TO

**ONTARIO AGRICULTURAL SERVICES
COORDINATING COMMITTEE**

February 27, 2002

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EXECUTIVE SUMMARY

The Ontario Pest Management Research & Services Committee (OPMRSC) met several times throughout 2001 to develop a strategic plan, outlined in this report, and to consider cross commodity pest management issues. Issues identified by the technical working groups were considered along with those forwarded from the Ontario Horticultural Crops Research and Services Committee and the Ontario Field Crops Research and Services Committee and the Ontario Weeds Committee.

The OPMRSC also organized the Ontario Crop Protection Meetings, held Nov. 6, 2001, in conjunction with the Crop Life Canada, Ontario Branch. There were 14 oral presentations, including key-note addresses by Dr. Frank Ingratta and Fred Vaughn. There were also 9 poster presentations, representing projects funded through the Food Systems 2002 research program, and the OMAFRA Special Research Fund.

Several issues were identified and discussed, including an increase in pests and diseases as non-tariff trade barriers. The need for improved access to crop protection materials, including biological and biorational materials continues to affect the industry at all levels. The delivery of extension and IPM services is continuing to evolve.

There has been some positive movement on issues identified in the 2000 report of the OPMRSC. The AAFC demonstrated their support for Minor Use programs by returning the funding formula to previous levels which allow for 75% funding of eligible URMULE trials. More publicly funded research stations and programs have achieved GLP certification, however, more accredited facilities are needed in Ontario and Quebec, if the system is to achieve the registrations that the industry needs.

The OPMRSC has also taken action to address another issue raised last year, that of rapid diagnostics for Ontario. A committee, lead by OMAFRA Crop Technologies staff, will investigate several possible means of providing these services. Options include the Pest Diagnostic Clinic but the committee will also look at services which might be available elsewhere within or outside the province.

Four recommendations were formulated from the reports and discussions. Access to crop protection materials continues to be a top priority. Two recommendations address the need for continued research on crop protection issues, including restoring the funding available for this research and maintaining the research teams needed to address the interrelated crop protection problems. These issues have not changed from the 2000 report, in fact retirements within AAFC have made the issue of maintaining research teams even more critical.

MANDATE

The mandate of the OPMRSC is to review and consider pest management and crop protection issues that may affect several different commodities within Ontario plant agriculture. The committee then identifies issues and formulates recommendations to address deficiencies and needs within the system. A second activity is the coordination of the Ontario Crop Protection Meetings, where industry representatives and researchers can share information on crop protection issues.

The committee also accepts the reports of the Technical Working Groups that review and update the OMAFRA crop production publications. These are:

- The Ontario Weed Committee
- Technical Working Groups which formerly reported to the Ontario Crop Protection Committee:
 - Field Crops
 - Fruit
 - Greenhouse Vegetables
 - Greenhouse Floriculture
 - Nursery, Ornamentals and Turf
 - Ginseng
 - Vegetables

COMMITTEE ACTIVITIES

The OPMRSC met three times during the year to develop a strategic plan for the committee and set the course for crop protection and pest management research for the next four years, as this corresponds with the ARIO review of pest management research.

The committee also continued the Ontario Crop Protection Meetings, which it re-established in 2000. The OPMRSC will cooperate with Crop Life (formerly the Crop Protection Institute) to continue this important annual conference.

The 2001 Ontario Crop Protection Meeting was held on Wed. Nov. 6, 2001, at the Victoria East Golf Club in Guelph. There were 14 oral presentations, including key-note addresses by Dr. Frank Ingratta, Deputy Minister of OMAFRA and Fred Vaughn, President of Vaughn Agricultural Services. Nine poster presentations highlighted the research funded by OMAFRA's FS2002 program and Special Research Program.

The annual meeting of the OPMRSC was held at the Guelph Turf Grass Institute on Dec. 12, 2001. The committee accepted the reports of the Ontario Weed Committee and reports of the Technical Working Groups representing: Fruit, Ginseng, Nursery, Ornamentals and Turf, Protected Crops, and Vegetables. The committee also reviewed the research priorities and recommendations forwarded to the OPMRSC from the Ontario Field Crops Research and Services Committee and the Ontario Horticultural Crops Research and Services Committee.

Responses to recommendations have increased, but there has still been no response from the PMRA. However, there have been some positive developments on a few of the issues identified in the 2000 report. Funding for Minor Use work from AAFC has been returned to the 75% level.

Previously this had been reduced to between 50 and 66% of the costs. There has also been an increase in the number of publicly funded research facilities that are GLP certified, including University of Guelph sites at Simcoe and Bradford, and field and greenhouse programs at AAFC Harrow. However, the infrastructure required for conducting GLP trials in support of Minor Use registrations still needs to be established. There is a need for sponsors and study directors for these projects. The Canadian Horticultural Council is lobbying for the establishment of a federal Minor Use Office. This would be a very important step toward resolving procedural issues that reduce the effectiveness of Minor Use programs in Ontario and other parts of Canada. At the recent meeting of the Ontario Horticultural Crops Committee, there was agreement to strike a committee to continue to address the issues around Minor Use registrations.

STRATEGIC PLAN

The Ontario Pest Management Research and Services Committee (OPMRSC) is a multi-stakeholder forum that develops research and service priorities for crop protection in Ontario. When appropriate, the OPMRSC forwards recommendations for the allocation of resources to OMAFRA for OMAFRA-funded pest management programs.

OPMRSC reports to the Ontario Agricultural Services Co-ordinating Committee (OASCC). OASCC in turn reports at a national level through crop expert committees of the Canadian Agri-food Research Council (CARC) which provides co-ordination for funding of research on a national basis.

VISION

"To seek progressive crop protection strategies that will keep Ontario's food supply safe and secure, the environment clean, and agricultural and rural sectors competitive, strong, and viable."

GOALS

The OPMRSC fosters the development of sustainable crop protection systems with emphasis given to practices that reduce risk, produce high quality crops and safe food and minimize environmental impact.

STRATEGIES

OPMRSC will fulfill its vision and goals through the following strategies:

- Promote integration of all available pest management strategies into crop production systems.
- Promote continued development and access to new crop protection tools.
- Promote practices that reduce the risks inherent with crop protection

- Promote the exchange of information, ideas and the development of synergies within the crop protection community.
- Encourage the availability of funding to address short term and long term needs
- Champion the recommendations and priorities of the committee to decision-makers

IMPLEMENTATION

- OPMRSC's Technical Working Groups and the Ontario Weeds Committee will work intimately with other OASCC committees (especially OFCRSC and OHCRSC) to establish and prioritize crop protection needs
- Utilize multi-stakeholder expertise to establish cross-commodity crop protection needs and priorities
- Establish and implement recommendations for fund allocation that reflect needs and priorities
- Develop crop protection recommendations that can be utilized as a basis for policy, resource and regulatory decisions
- Organize and conduct provincial crop protection conferences to facilitate the reporting and exchange of information
- Act as a resource to support and foster the development of a sustainable crop protection strategy for Ontario
- Support an effective Minor Use of Pesticides Program for Ontario including: residue and efficacy testing, GLP certification, funding, needs identification and prioritization and commitment by institutions to minor use research

Research and Service Priorities of OPMRSC

- AVAILABILITY OF CROP PROTECTION TECHNOLOGIES
 - biological, chemical, genetic, regulatory
- PEST ECOLOGY AND BIOLOGY
 - existing and emerging pests
- RESEARCH AND DEVELOPMENT OF NEW AND IMPROVED CROP PROTECTION MEASURES
 - integrated control and alternative methods
- DEVELOPMENT AND DELIVERY OF EFFECTIVE IPM PROGRAMS
 - new and existing
- COMPILATION AND EVALUATION OF EXISTING KNOWLEDGE
 - updates to Environmental Impact Quotient (EIQ), databases and forums

ISSUES

Pest problems are becoming trade issues with the United States. Quarantinable pests and diseases can become non-tariff trade barriers. This includes issues such as chrysanthemum rust which is in British Columbia and sudden oak death, which has been found in California. These are especially important for the ornamentals industry. The specialists report that the CFIA has been very supportive in their response to these issues.

Nutrient management and Nutrient Management Planning is a major issue for Ontario agriculture. The possible effects on production agriculture are most often discussed, but it must be recognized that changes in nutrient levels can also affect pests and influence pest management decisions. The implementation of Nutrient Management in the province must take into consideration the effect on pests.

Ongoing Issues

The continuing evolution of field diagnostics, extension services and delivery of Integrated Pest Management programs in Ontario means that there are on-going changes in extension services and delivery of IPM programs in the province, and these are being felt at the grower and industry level. More consultants are needed, many commodities still do not have IPM programs, and there is continued demand for training of scouts and of consultants. OMAFRA continues to play a role in scout training and there has been good cooperation between OMAFRA and AIMS (Agricultural Information Services).

Growers continue to emphasize the need for non-biased crop information and pest management programs throughout the province, including field diagnosis of crop problems. In order to remain competitive, Ontario growers need the unbiased expertise of extension personnel. Two-way communication with growers and others in the industry is essential, including agriphones, newsletters, the internet, presentations, farm calls and individual contacts.

The potential for pesticide residues that exceed the MRL to appear in food produced in Ontario still exists, despite the major advances in pest management. This remains a food safety issue, and is critical for maintaining consumer confidence, and in some cases, export markets. The OPMRSC recommends continued support of OMAFRA's pesticide residue monitoring and analysis program.

Consolidation within the crop protection industry is not over, company mergers are still occurring. This will continue to affect the number of people employed in the industry, and is expected to result in less discovery research, and less research and development in

general. The result will most likely be a reduction in the number of crop protection materials being offered and may reduce the number of minor uses on labels.

Maintaining research teams and succession planning for research programs continues to be a concern of the industry. There is an important synergy that results from having a research team in a single location. As a significant proportion of the research community prepares for retirement, plans to maintain research programs and effective teams should be developed by research managers in consultation with the industry.

The implications of the Supreme Court decision that allows municipalities to ban pesticide use may have an impact on the agricultural community, and most certainly on the turf and ornamentals sections of the industry. The definition of "cosmetic use", where these bans will be introduced and how they will be enforced are all important questions. This also ties in with concerns about water quality and safe alternatives to pesticides. Increased use of nitrogen is often part of a program to reduce herbicide use in turf. Also, some "organic" or homemade alternatives to commercial pesticides, such as nicotine infusions, can be more dangerous to the public or the environment.

The need for improved accessibility of Ontario growers to crop protection materials, including IPM friendly materials and biological and biorational products, was identified by virtually every commodity group. This includes access to products used by growers of similar crops in the United States.

RECOMMENDATIONS ARISING FROM GAPS/BARRIERS

OPMRSC Recommendation #1.

Target Agencies:

Pest Management Regulatory Agency, Policy Branch
Agriculture and Agri-Food Canada

Title: **Improve the Access to Crop Protection Materials, including Biologicals and Biorationals.**

Details:

i Availability of Crop Protection Materials :

A system of Special Exemption for least toxic products (similar to that of the EPA) would increase the availability of IPM compatible materials, and the system for the registration of biological controls must undergo significant changes to make these materials available to growers. Currently, at least one product (Diallyl disulfide for the management of white rot on onions, a biorational product in the EPA system) was not submitted for joint registration because of concerns that the Canadian registration system would slow the U.S. registration.

ii Adequate funding for Minor Use Registration Trials and Residue Analysis

Researchers, extension personnel, industry and grower cooperators require adequate, consistent and stable funding to ensure completion of requirements under the minor use system. More flexibility with regard to funding minor use projects is required and more communication with the sponsors of minor use projects is needed. The committee is pleased that AAFC has responded to the concerns about funding by returning to the 75% funding of the project costs.

Unreasonable and costly additional studies seriously erode the ability of Ontario growers to compete in the world market and discourages companies from introducing new technologies to Ontario. Growers in the United States may lose many of their traditional pest control products, however many new alternatives are being evaluated and registered to replace them.

While improvements have been made to the system of registering pesticides, for instance, the URMULE system is gradually becoming faster, and joint registrations are proceeding, significant barriers still exist. The increase in AAFC funding of Minor Use work, back to the previous level of 75% is an important step and has been well received by the industry. However, there are still infrastructure issues that need to be addressed and the funding agencies must be prepared to cover the real project costs, which have increased with the requirement for GLP studies. This committee strongly supports the implementation of a federal Minor Use Office, as proposed by the Canadian Horticultural Council.

Because access to crop protection materials is such an integral part of agricultural production, and competitiveness, the PMRA is urged to do the appropriate consultation with the agricultural industry before deregulating a product, and to provide the appropriate lead time for the consultation process. Also, it is imperative that the availability of alternative materials is considered before a product is removed from the market.

Background:

The American Food Quality Protection Act has, and will continue to, result in the loss of many older pesticides in both Canada and the United States. Because growers still need crop protection materials to replace those that are lost, the Canadian system must move to "catch up", such that Ontario growers have access to the crop protection materials that are also used in the United States.

Ontario growers remain at a competitive disadvantage in the world market as a result of limited access to crop protection materials, including new chemistry, biological controls and biorational, or least toxic products. Ontario growers often must use older, less environmentally friendly products, because new materials are not registered. The implementation of the Food Quality Protection Act in the United States will mean that some of the older materials will no longer be available, or that produce treated with these products cannot be exported to the U.S. While American growers have access to new products and new chemistry to replace those materials that are lost, Ontario growers often do not have access to these, or must wait years before these products are registered. In some cases, the costs of a Canadian registration are such that it is not economically feasible.

OPMRSC Recommendation #2.

Target Agencies:

Title: Increased Funding for Crop Protection Research

Details:

In light of the success of the Food Systems 2002 program to date, this committee wishes to convey to OMAFRA, ERLD and ARIO, the need to continue support towards research which accomplishes the goals and philosophy of the FS2002 program which have been expanded in the special Research Program, Pesticide Reduction and Safe usage. The goal of improved integrated crop management strategies leading to high quality food supplies requires a long-term and dedicated commitment. The OPMRSC requests that annual funding for any new FS2002-like programs be set at \$1 million a year, which is still below the original \$800,000.00 level, in 1987 dollars.

Background

During the course of the Food Systems 2002 program, many successful and economically sustainable research and development projects have led to significant improvements to IPM programs and pesticide reduction. According to recent figures, there has been a 30% reduction in the amount of pesticide used in Ontario and a concurrent 30% reduction in the risk associated with their use. It was also identified that further public resources be targeted to fruit and vegetable crops.

The development of IPM and more recently ICM (Integrated Crop Management) programs requires a stable and dedicated source of funding to ensure that new problems and serious on-going problems are addressed. In light of the general 'public good' that such programs have achieved to date, it is recommended that they be fully supported in the future. Over the past five years, the funding available for this type of research through the OMAFRA competitive funds dropped from \$800,000 per year for the FoodSystems 2002 program down to \$200,000 per year for the portion of the OMAFRA Special Research Program, and more recently the New Directions in Agricultural Research Program, that deals with similar issues. This funding needs to be restored.

OPMRSC RECOMMENDATION #3.

Target Agencies:

Agriculture and Agri-Food Canada

Title: Maintaining Research Capacity and Effective Research Teams in Ontario

Details:

Several senior scientists within the AAFC stations in Ontario, and particularly in Vineland, are nearing retirement age or have recently retired. . A comprehensive plan to provide for orderly and effective replacement of the research expertise is needed. The emphasis must be on maintaining and enhancing the synergy that results when there are research teams with related disciplines that can address the complicated pest management and integrated crop management issues on groups of crops. A commitment to long term, A-based research funding is needed to maintain research on sustainable production, and IPM systems including resistance management.

Background:

Several of the horticultural industries have concerns and requests that involve maintaining research teams and planning for replacement of expertise in preparation for the retirements of several senior researchers with valuable skills and experience.

The greenhouse floriculture industry requests that a permanent floriculture pest management program be established at AAFC Vineland. In 1997, industry funding was used to fund five specific projects in Vineland. Now a more permanent commitment to this research is requested. Both a plant pathologist and entomologist are needed to develop the necessary knowledge and understanding of the unique growing environments and to establish meaningful ongoing research programs. As an example, there is a large team of researchers at AAFC Harrow, who focus on greenhouse vegetables, including production, pest management and post-harvest issues. The vegetable industry has certainly benefited from this rare research commitment.

The grape and wine industry also needs research expertise, including an entomologist (insect ecologist or related discipline) to respond to changes in the pest complex and control options. Maintaining expertise in plant pathology, virology and nematology is also critical to this and other industries, such as berry crops and vegetables. A commitment was made to fill the nematology position, however, with the reorganization within AAFC there remain questions as to whether this and other important positions will be filled, and the research continued.

OPMRSC RECOMMENDATION #4.

Target Agencies:

Ontario Ministry of Agriculture, Food and Rural Affairs.
Univ. of Guelph, Laboratory Services Division

Title: Improved Access to Rapid Diagnostics for Ontario Agriculture

Details: Access to rapid and accurate diagnostics of plant diseases , including viruses, bacteria and phytoplasmas as well as other pests is crucial to the industry. The OPMRSC recommends that a committee be established, under the leadership of OMAFRA, to look at creative, innovative and cost effective solutions to provide these services. Possible solutions can involve the Univ. of Guelph Pest Diagnostic Clinic, but other alternatives need to be investigated, such as other labs or programs. The committee should investigate how these samples are handled in neighbouring jurisdictions. Grower representatives should be included, and the field vegetable, greenhouse vegetable and berry industries should be represented.

Background :

Several diagnostic procedures based on PCR are now available, including tests for the aster yellows phytoplasma in aster leafhoppers, which transmit the disease, aster yellows, to lettuce and carrots, anthracnose on berries, plum pox on nursery stock, and viruses on grapes and raspberries.

When requests for PCR- based or other rapid diagnostic tests have been requested, Laboratory Services Division has looked at offering the single test for a single crop. The reply has been that the business case does not justify offering this test. These rapid diagnostic tests would benefit a number of sectors of the industry. Additional tests are being developed each year, and several of the tests that have been developed have been funded by OMAFRA and the FS2002 program. Thus, the OPMRSC recommends that creative solutions to provide access to rapid diagnostic services be investigated, and that this involve representatives of all of the stakeholders.

CURRENT INITIATIVES IN THE MINOR USE PROGRAM

Jim Chaput, Provincial Minor Use Coordinator

- Summer tour for PMRA review staff, July 2001 was very successful; 2002 tour plans are underway
- National prioritization process completed in August 2001
- Canadian delegation of minor use coordinators, PMRA and CHC attended IR-4 food-use workshop in Sept. 2001
- CHC participated in conference call with IR-4 and EPA to review and resolve common issues, Oct. 2001
- CHC participated in IR-4 research planning meeting Nov. 2001
- CHC representative visited a number of US registrants to review new products and opportunities for joint reviews
- An ADM level meeting was held Oct. 3, 2001 with OMAFRA, BCMAF, MAPAQ and PMRA in Quebec City to review minor use issues: these included review of:
 - Crop zone data requirements
 - Lack of use of crop groupings in Canada
 - Perceived lack of success with the URMUR program
 - Lack of access to reduced risk pest control products

- Lack of access to inclusive biopesticides
- Lack of seed treatment harmonization

Results of this meeting?

- PMRA agreed to 'take under advisement' these issues
- PMRA wants more residue data to prove zones are equivalent
- PMRA will consider using crop group efficacy and residue logic on minor use submissions
- PMRA wants provinces and growers to participate with registrants on URMURs
- PMRA is reviewing the seed treatment harmonization proposal
- PMRA agreed to consider using the US 'reduced risk' and 'biopesticide' classification on minor use submissions

All of these issues reviewed at the F/P/T meeting and MUC meeting, Oct. 2001

The national NOMULE group met via conference call to review issues, current projects and establish new priorities, Nov. 2001

Development of comprehensive crop profiles that can be used for better re-evaluation decisions and better risk mitigation decisions. PMRA and AAFC are required to work together on this in collaboration with the provinces

Dec. 20, 2001, meeting will be held with PMRA to review current templates and discuss how the data can be presented in a common format

Late Nov. 2001, CHC released to the public a detailed minor use briefing book outlining the key issues and proposed solutions to these issues.

Items reviewed included:

- URMUR
- Data requirements for URMULEs
- Emergency registrations
- Unfair risk cup assessments
- Need for an ombudsman
- Crop zones
- Crop groupings
- Seed treatment harmonization
- More flexible joint review process
- Establishment of an independent office of minor use

Dec. 5-6, 2001, CARC Minor Use Workshop held in Ottawa

Minor use priorities for 2002 currently being established in Ontario by OASCC committees

OMAFRA minor use website updated regularly and found at:

www.omafra.gov.on.ca/english/crops/minoruse/

Improvements to tracking URMULEs implemented by PMRA at request of provinces

Meetings with Crop Life Canada have been held to review issues and solicit assistance

- Funding issues for GLP residue trials and the lack of infrastructure available to conduct GLP trials remains a major obstacle

- At the recent practical level however, almost every minor use submission runs into major data requirements. If waivers for residues or efficacy are successful (less than 20% of the time), then new requirements for crop tolerance are imposed. Until the issues highlighted above are fully resolved, the minor use system will face serious challenges

- Provincial view of minor use registrations is that they provide the necessary tools for the sustainable production of agricultural commodities. They must be safe for the environment, consumer, growers and workers, be IPM compatible, be low and reduced risk, be effective and help our growers compete in a global marketplace

INTEGRATED PEST MANAGEMENT UPDATE

Marg Appleby, IPM Systems Specialist

There have been several activities relating to IPM programs in the past year. A review of the FoodSystems 2002 is on-going, and focus groups have been consulted on IPM programs in the province. The Grower Pesticide Safety Course continues to be very effective. Training of IPM scouts will continue in 2002, and each training program will include an introduction to IPM.

One of the major activities has been the organization of the International IPM Conference, Exploring New Frontiers in Integrated Pest Management. The conference will be held from March 24-26, 2002 at the International Plaza Hotel, Toronto.

ONTARIO WEED COMMITTEE REPORT

Executive Summary

The Ontario Weeds Committee met in April, July and November of 2001. The main activity in November was the updating of publication 75, Guide to Weed Control 2002.

Weather conditions in 2001 proved to be challenging again and this often affected negatively the performance of herbicides. The threat of herbicide resistance is increasing with many reports of ragweed escaping treatments with Group 2 herbicides. Other trends observed include the increase in the use of low drift nozzles, the reliance on post-emergence herbicides despite the emergence problem of weeds, and the continued use of herbicide tolerant crops.

Committee Activity

The Ontario weed committee met on the 11th of April in London.. Sub-committees made their reports. Some discussion revolved on priorities and it was decided that a vote would take place to establish a ranking. The committee broke into smaller groups to discuss on what the future of weed science in Ontario would be. The Ontario weed tour was held July 16th to 19th in Centralia, Harrow, Woodslee, Ridgetown, Simcoe and Elora. The committee met at Ridgetown on the 18th of July to approve ranking of priorities. The fall meeting was held on the 5th of November in Guelph. The main task of the committee was the update of Publication 75, Guide to weed control 2002.

Sector scan

Weed control results

Weed control was challenging again this year. A good April lead to a cool damp May, not leaving many days with good soil conditions for planting late spring crops and stressing the growth of early planted crops. Late frost and hail hurt several areas, and windy conditions made spray applications risky at many times. Once the rain stopped, it did not start again in many areas until harvest. The summers prolonged dry spell was the worst in 50 years.

Soil applied herbicide worked very well in the corn crop but opportunities for soil applied spraying in soybeans were challenging. Post-emergence spraying was likewise challenging with many fields sprayed beyond the optimum stage of growth and control was reduced. Weed escapes were visible in many fields, especially as the crops stopped growing under severe drought. This weed competition through the critical period, in combination with the severe drought, and the infestation of a new pest, soybean aphids, hurt many yields by as much as 50% in soybeans. The continued threat of soybean aphid may reduce the acres planted to soybeans next year.

Trends

- Use of post-emergence herbicides in corn and soybeans continues to be widespread, but the development of new weed problems, including herbicide resistant weeds may slow this trend
- Low drift nozzles continue to be widely used by both grower and custom applicators
- Horticultural growers are increasing their use of plasticulture, mostly for vegetables
- No-till or reduces tillage systems are increasing in most crops, and have altered the weed populations
- GM crops continue to be planted, but market uncertainty will continue to temper the growth of this technology. Roundup ready (RR) soybean varieties have about 35% of the acreage, while canola is greater with 75% RR varieties. In corn, there is about (5 planted in Liberty link and 5% to Roundup Ready. There is as awareness of the risk of genetic drift in canola but it has not been documented in Canada

The market for Identity Preserved (IP) crops has softened, with lower premiums being offered, due to more competition from growers in the USA

Problem Weeds

Common weeds like red root pigweed, ragweed and lamb's-quarters eluded many of our common control programs this year. No-till weeds like spreading atriplex, sow-thistles, and prickly lettuce continue to increase. Lots of grassy weeds escaped herbicide treatments this year, with foxtails (especially yellow foxtail) being an increasing problem. Horticultural growers are challenged by common groundsel, yellow nut sedge, proso millet, hairy nightshade and controlling weeds in general.

Herbicide Resistance

Red rot and green pigweed resistance to Group 2 herbicides are now common, especially in the areas first identified in 1997. New in 2001 is Group 2 resistance in common ragweed, with over 120 suspected samples from southern Ontario to be tested. Eastern black nightshade has also been confirmed with Group 2 resistance. Pigweed resistant to linuron has also been confirmed on carrot farms in several locations. There is awareness of the risk of resistance among farmers, especially with widespread use of glyphosate and more adoption of recommended management techniques.

Weed Control Act

There were approximately 500 weed orders issued in 2001, which is similar to records for recent years. The majority of these were in urban areas. Weed inspectors are encouraged to enforce the weed control act only on properties adjacent to agricultural lands.

Minor Use Program for Herbicides

Jim Chaput is the OMAFRA Minor Use Coordinator in Guelph, who maintains a website with updated information on Minor use Proposals at www.omafra.gov.on.ca/english/crops/minoruse/. Currently there are 83 active minor use requests for herbicides on interest to Ontario growers. Sixteen herbicides were registered through the MUPP program this year that will be included in the 2002 Publication 75.

Extension Activities

The new organization of extension services across Ontario is now fully implemented with 2 weed management specialists. The Weed Management Specialist (Field crops) is vacant, with the competition closing November 30. In addition, we have engineering specialists in application technology, and crop specialists for each crop who handle all aspects of production, including weed management.

Guide to Weed Control (Pub 75) remains as an annual publication. The 2002 version, revised by the Ontario Weed Committee, will be available in early January

Ontario Weeds (Pub 505) is in revision with publication in 2002. 37 new weed species are included
New factsheets were published on Herbicide Resistance, Organic Farming, Cocklebur, Pigweed and Field Bindweed
The Ontario weeds page is online at:
www.gov.on.ca/OMAFRA/english/crops/insects/weeds.html. A free subscription service has been added this year for notices of new content posted.

Global Issues

The government of France has recently announced the phasing out of atrazine. This news, coming from a major agricultural country, forewarns of increasing pressure on this type of herbicide. This should be seen as a major concern for Ontario corn growers as the withdrawal of atrazine in Canada would have major impact on weed management. This should be seen as further incentive for the adoption of technologies and systems that will show responsible use of our herbicides.

Cross Commodity Weed Research Priorities

Priorities are ranked by major categories, then by sub-priorities within each heading.

1. Minor use registrations:

Herbicide efficacy and residue studies leading to registration of minor use products in horticultural crops, specialty field crops (e.g. beans), or for problem weeds not currently on product labels in field crops, under the URMULE and URMUR programs. OWC members have prepared a prioritized list of minor use projects by crop.

2. Environmental Issues:

1. Evaluate and monitor the ecological and environmental impact of herbicide tolerant crops, including (i) shifts in weed populations, (ii) development of herbicide resistant weed biotypes, (iii) transfer of recombinant genetic material to other plant or microbial species, and (iv) changes in the composition of soil microbes.
2. Develop improved methods for the rapid, efficient detection of herbicide residues in relation to: (i) off-site contamination, e.g. drift, run-off, leaching, (ii) herbicide carry-over and crop rotation, and (iii) applicator, grower, bystander exposure to dislodgeable foliar residues on plants.
3. Evaluate and monitor the impact of unsprayed buffer zones along field margins on weed population dynamics and crop yields, and develop vegetation management systems for field margins, roadsides and rights of way.
4. Determine the environmental variables affecting the production, release and dispersal of pollen from ragweed and other allergenic weed species affecting the health of

Ontario residents; develop a model predicting the timing and severity of pollen load near major metropolitan areas.

3. Herbicide Reduction and Safe Usage:

1. Establish economic thresholds for problem weeds, e.g. sowthistle, sandbur, prickly lettuce, with consideration for crop quality, dockage, harvest moisture, and weed seedbank issues.
2. Evaluate the effectiveness of cultural (e.g. crop rotation) and mechanical methods of weed control in combination with weed specific herbicide rates (minimum lethal dose) to minimize herbicide use within integrated weed management (IWM) systems.
3. Evaluate advanced sprayer technologies, including site-specific applications, which have the potential to reduce herbicide rates, spray drift, spray volume, sprayed area and effects on non-target organisms, to meet the needs of custom applicators and growers.
4. Evaluate effectiveness of cost-effective, broad-spectrum biological control agents, including seed predators, to replace or reduce herbicide use in crop and non-crop areas.

4. Weed biology and ecology:

Basic research on weed and seed biology and ecology, including population dynamics, physiology and weed-crop interactions.

5. Emerging Pests / Invasive weed species:

1. Biology and control of herbicide resistant weeds in field and horticultural crops.
2. Identification and management of invasive weed species in crop and non-crop habitats, e.g. purple loosestrife

Weed Issues for Horticultural Crops

1. Minor Use herbicide registration, including tank mixture applications of herbicides with fungicides or insecticides for crops such as onions or tomatoes.
2. Integrated weed management systems (IWM) for horticultural and specialty crops, particularly where herbicide options are limited or unavailable.
3. Control strategies for problem weeds in horticultural crops.
4. Re-cropping or plant-back studies to establish safe intervals between herbicide application and planting of sensitive crops, e.g. Pursuit, Classic, Broadstrike, or FirstRate before sugar beets, peas, sweet corn, tomatoes, etc.
5. Interactions of weeds or weed control methods with insect or disease problems, e.g. asparagus rust and pigweed species.

Weed Issues and Priorities for Field Crops

Agronomic Systems and Environmental Sustainability

Ontario Weed Committee Field Crop Research Priority #1.

Develop management strategies for emerging problem weeds that will be sustainable in the long term.

The Issue: Profound and dramatic changes have occurred in cropping systems across Ontario over the past decades. The increasing adoption of conservation tillage practices and the introduction of new herbicide technologies have caused the emergence of new weed problems. In most cases, the "new" species take over niches left open or created following changes in tillage and/or weed management practices. Problem weeds are very often perennials although spring and winter annuals are also encountered. These species are challenging for growers, as they are often not covered by herbicide labels.

Current Research/Extension Activities: Current research adequately assesses which herbicides are effective on specific weed species. Research on many problem weed species has been conducted or is currently being done at the Ridgetown Campus and the Main Campus of the University of Guelph, and at AAFC Harrow. The following table indicates the weed species and the locations where research takes place.

Species	Guelph	Ridgetown	Harrow
Annual sow thistle		X	
Beggarticks		X	
Bur cucumber		X	
Canada fleabane	X	X	X
Canada thistle		X	
Cocklebur		X	
Common chickweed		X	X
Crabgrass		X	
Dandelion		X	X
Eastern black nightshade			
Goldenrod		X	
Field horsetail		X	
Field violet	X	X	

Horsenettle		X	
Perennial sow thistle		X	X
Prickly lettuce		X	
Proso millet		X	
Quackgrass	X		
Red top		X	X
Sandbur		X	
Spreading atriplex		X	
Swamp smartweed		X	
Three seeded mercury	X	X	
Tufted vetch	X		X
Volunteer corn	X	X	
Volunteer hemp		X	
Wirestem muhly		X	

Gaps/Barriers/Deficiencies: As such, the information generated is very useful for end-users. It is necessary however to find means to effectively channel the information to end-users while taking into account the limitations imposed by herbicide labels.

Nevertheless, there is a need to develop a database on the best ways to control these species in the major field crops of Ontario. Although herbicides would be the management tools of choice, strategies should not be exclusive and should encompass other approaches such as mechanical and cultural. Management strategies should aim at developing long-term solutions and avoid short-term "Band-Aid" approaches that could create further problems. This means that the biology of the problem weeds should be the aim of those studies at its understanding forms the base of long-term, integrated solutions.

This type of information is lacking for most of those species. The fact that,

as a

whole, weed management in Ontario is rapidly evolving needs to be taken into account. The availability of technologies such as Roundup-Ready and Liberty Link can bring solutions, but can also be the source of new concerns. While

herbicides such as glyphosate, glufosinate and others can provide adequate control of problem weeds, care should be taken to avoid overuse so the mistakes of the past are not repeated.

Ontario Weed Committee Field Crop Research Priority #2

Development of Integrated Weed Management (IWM) systems for field crops.

The issue: Past experience in Ontario and elsewhere has proven that reliance on herbicides as the sole means to control weeds can cause problems such as the development of resistance, shifts of weed community composition, over-application of herbicides, and accumulation of residues in the soil. IWM systems aim at reducing the negative effects of weed management, preserving efficiency in weed management while taking into account environmental and societal needs.

IWM works by destabilizing weed populations and shifting the weed-crop interference equilibrium in favour of the crop so as to maximize yields and quality. Herbicides are integral parts of IWM systems along with cultural, mechanical and biological methods. Yet, IWM does not simply mean mixing different methods together in the hope that better results will ensue. IWM needs not be reactive to problems but rather predictive and proactive. Knowledge of weed thresholds, critical periods of interference, weed germination/emergence patterns, etc., are biological information that is critical for IWM systems.

Current Research/Extension Activity: Research on modeling of weed emergence is currently being conducted at the University of Guelph. Evaluation of the effect of row width, crop density and tillage management on weed seed predation is done at the University of Guelph. Experiments on critical period of interference in no-till soybeans are conducted at AAFC Harrow. Research on the effect of weed threshold based decision support systems is being conducted as a joint effort between AAFC Harrow, University of Guelph Ridgetown and Guelph campuses.

Gaps/Barriers/Deficiency: More long term studies, comparing different approaches to IWM so as to demonstrate/prove their effectiveness, are needed. Limitation in funding for long term research is a severe problem for that type of research.

Ontario Weed Committee Field Crop Research Priority #3

Evaluate effectiveness of new herbicides to assist registration and provide information on environmental impact.

The issue: The introduction of new herbicides by agrochemical companies has been increasingly difficult over the past decades. This is due to increased R&D costs, increasing stringency in registration requirements and depressed value in the agricultural sector. It is therefore of prime importance that any potential new herbicide is widely tested across the province and that this testing is not conducted only by the companies developing the products. The fact that some of the data that supports registration is obtained at arms length from the companies can be a reassurance for end-users that the information is as correct as can be.

Current Research/Extension Activity: Research on the evaluation of new herbicides is on-going at the University of Guelph (Guelph, Kemptville, Ridgeway) and AAFC Harrow.

Gaps/Barriers/Deficiency: Most of the research that is conducted by the public sector is sponsored by agrochemical companies. They will look for specific use patterns as dictated by registration requirements and forecasted market placement. Independent assessment allows for the examination of use patterns of interest that might be overlooked by the companies.

Ontario Weed Committee Field Crop Research Priority #4

Determine weed specific post-emergence herbicide rates and critical factors affecting their performance.

The Issue: There is a perception that herbicide label rates are sometimes too high than what should be required to obtain adequate control on specific weed species. Requirement for herbicide labels include a built-in safety factor that takes into account wide weed spectrum (a range of different species) and variable environmental conditions. The fact is that herbicide doses could be tailored so as to take into account the susceptibility of specific species. In many instances that tailoring would result in significant reduction from the label rate, without sacrificing efficacy. This information will help growers minimize herbicide use by adjusting the dose to the particular weed problem.

Current Research/Extension Activity: Work on weed specific post-emergence herbicide rates for corn and soybeans is currently being done at AAFC Harrow. Related work on herbicide rates in corn is conducted at the main campus of the University of Guelph.

Gaps/Barriers/Deficiencies: Such data will be inherently variable and this variability will need to be assessed before recommendations are to be made. Variability comes from two main sources:

- 1) the fact that environmental conditions have a strong impact on herbicide performance, especially when doses are reduced;
 - 2) there is variability among weed populations across the province that warrants this type of investigation to be conducted on a larger scale.
- The above mentioned sources of variability need to be documented further.

Ontario Weed Committee Field Crop Research Priority #5

Construct a database of herbicide use histories/patterns and occurrences of herbicide resistance in Ontario to aid in the development of resistance management guidelines.

The Issue: Resistance to Group 2 herbicides (ALS inhibitors) is rapidly developing in weeds in Ontario. It has appeared in 1997 in green and redroot pigweed and has been confirmed in 2000-01 in Eastern black nightshade and common ragweed. Group 2 herbicides comprise the sulfonylureas (thifensulfuron, Classic), the imidazolinones (imazethapyr, Pursuit) and the triazolopyrimidines (flumetsulam, Broadstrike). These herbicides have favorable features such as low mammalian toxicity, low use rate, good crop safety and high weed control efficacy. Resistance renders these herbicide(s) inefficient on the affected weed populations and very often force farmers to resort to re-spray programs. Eventually, this may force growers to use alternative herbicides with less favorable characteristics.

Research/Extension Activity: Research is being conducted at the University of Guelph (Guelph campus) on characterizing resistance in green pigweed, redroot pigweed, Eastern black nightshade and common ragweed. The Herbicide Resistance Subcommittee of OWC is currently devising recommendations for the management of resistance that are based on current research information.

Gaps/Barriers/Deficiencies: Eastern black nightshade and common ragweed need to be further characterized so that alternative herbicides can be identified. Farmers and consultant need to be able to rapidly identify resistance through the use of reliable diagnostic tests. Rapid confirmation eliminates second-guessing and allows early planning of management strategies. It also allows for the identification of reliable alternative herbicides, preventing the costly use of inefficient rescue treatments. The link between resistance and potential fitness penalties associated with it need to be investigated further. What is the effect of resistance when alternative herbicides are used? Would resistance genes affect survival in the seed bank? This need to be determined on a weed specific basis so as to help in the better design of management programs. There is a need for the development of comprehensive management tactics to deal with resistance and to prevent its

occurrence. Ideally these should be based on the adoption of Integrated Weed Management programs that would proactively target weed problems and not just react to the occurrence of resistant populations.

Ontario Weed Committee Field Crop Research Priority #6

Develop and evaluate site-specific methods of weed management as a means of reducing weed control costs and/or improving efficiency.

The Issue: Site-specific weed management targets only those areas of fields where weed problems occur with an emphasis on weeds with patchy distributions. It has been shown that it is possible to effectively target weed patches thereby reducing herbicide use by up to 60%.

Research/Extension Activity: Research is currently done at the main campus of the University of Guelph for the development of a sprayer capable of detecting weeds and triggering herbicide application.

Gaps/Barriers/Deficiencies: A major barrier preventing the adoption of this approach is the difficulty in obtaining precise and reliable weed maps in a quick and inexpensive manner. Remote sensing technology is seen as potentially being able to provide this kind of information, but we need to understand the limitations of this technology. More importantly we need to determine what resolution needs to be achieved in the detection of weeds. As this approach target weed patches, we need to increase our understanding of weed patchiness. Why are weeds patchy? Are patches stable, allowing maps to be reused over the years? Can we predict patch expansion? What is the effect of targeting patches on the overall field dynamics? What would happen to weed threshold if patches are targeted? These are only few of the questions that need to be answered so that the technology that will be used will be based on sound biological principles.

Ontario Weed Committee Field Crop Priority #7

Determine the effect of varying nitrogen rates in corn on weed competitive ability, weed seed germination patterns and the effectiveness of control measures on species such as foxtails, barnyard grass, pigweeds, lambsquarters and common ragweed.

The Issue: It is very likely that government regulations will impose limits on the amount of N fertilisers farmers will be allowed to put on crops, especially on coarser textured soil. As N is the nutrients for which weeds compete the most with corn. Therefore a reduction in fertiliser levels may negatively impact on the outcome of the weed-corn competition, to the disadvantage of the crop. This may, as a result, mean that weed control measures need to be

intensified. The effect of reducing N levels on the ability of crops to withstand competition deserves to be looked at.

Research/Extension Activity: Research is done at the main campus of the University of Guelph to investigate the effect on N level on the competitive ability of green foxtail and corn

Gaps/Barriers/Deficiencies: No research is currently done to study the effect of varying N level on the competitiveness of other species such as common ragweed, lambsquarters, pigweeds, and barnyardgrass.

FRUIT TECHNICAL WORKING GROUP

The Fruit OCPC subcommittee met on October 30, 2001 in Simcoe.

The agenda included the following:

- Review of submissions and changes to Publication #360, Fruit Crop Recommendations. This was a full reprint year so new content and editorial changes were discussed in general at the meeting. Submissions and changes for pesticides to the calendars, charts and tables changes and additions were reviewed and have been organized in chart form for this report.
- Time was spent on the protocols used for pesticide submissions, listing of pesticides with respect to ranking and rate choice. Decisions are outlined in the minutes.
- Discussion of emerging issues and recommendations in pest management. These are outlined in this report.
- Review of research priorities. These were not ranked and were passed to the appropriate OHCRSC subcommittee for their consideration
- Pesticides for minor use registration were not discussed.
- Membership of the committee- this was updated and membership list is included in this report

The committee was active early in 2001.

Ad hoc committees of Fruit TWG reviewed the following submissions.

AgriMek for control of STLM on apple – approved

Bioprotect CAF for control of OBLR on apple – not approved

Success for control of OBLR on apple – not approved

Pest Management Issues and Recommendations

Impact of Pesticide Re-Evaluation Regulations USDA-EPA –Food Quality Protection Act - PMRA-Pesticide Re-evaluation

The regulatory reviews and pesticide label revisions announced by the USA-EPA re: the Food Quality Protection Act, combined with Canada's Pest Management Regulatory reevaluation of the organophosphate insecticides and now streptomycin has the potential to adversely affect the fruit industry.

The first wave of restrictions of pesticide use with respect in these reviews occurred on November 1, 2001 in USA. EPA announced new restrictions on the use of azinphosmethyl. These new restrictions on use will immediately cancel 28 crop uses. For fruit these restrictions include plums, prunes, blackberries, boysenberries, loganberries, raspberries, grapes. Tart cherries, cranberries and peaches will be phased out in four years. Apples, blueberries, sweet cherries and pears and cane berries will continue on a five-year "time limited" basis.

In Canada, Streptomycin will be phased out of the market. Recently, PMRA has asked for new data set that the company is not prepared to generate as the market is too small. Streptomycin will not be available by Dec 31, 2003. With no viable control for Fire Blight, the apple and pear plantings are at high risk of completely being destroyed by this devastating disease.

The fruit industry is dependent upon pest control products such as Streptomycin, Guthion (azinphosmethyl), Sevin (carbaryl) and Rovral (iprodione). Ontario has an excellent track record on the production of safe quality fruit produced through scientifically documented Best Management Practices including Integrated Pest Management (IPM). These programs have taken years to develop. The potential loss of key products regulatory action or unrealistic restrictions on the use pattern would seriously impede the continued of a safe, high quality product.

Recommendations:

- We encourage research and extension personnel to continue to develop and refine viable and sustainable pest control strategies that are consistent with the objectives of IPM and risk reduction

- We strongly urge AAFC to fill the vacant population ecologist entomologist and vacant plant pathologist position and now the soon to be vacant nematologist at the Vineland AAFC location as soon as possible.
- We urge further work to evaluate the "fit" of newer pesticide alternatives and reduced risk products
- We recommend additional research to demonstrate the "fit" of the older more traditional products including azinphosmethyl, carbaryl and fungicides such as iprodione and the EBDC's
- We strongly recommend research to support minor use and harmonization of control products that are available to our U.S. counterparts
- We recommend that OMAFRA work with growers to raise the profile of IPM. Highlight the achievements of the IPM programs to the consumer and the message that Ontario fruit growers take very seriously the health and safety of the products they provide for consumers.
- We encourage PMRA to provide an opportunity for the fruit industry as a whole to comment on re-evaluations of pesticides before decisions are made, similar to the EPA's National Registry.

Human Resources for Pest Management Research, Development and Implementation of Fruit Crops

A common theme that has surfaced in our review of pest management research projects for the fruit crops is the need for a comprehensive research, development and implementation of IPM programs and pesticide resistance management strategies. While an ambitious goal, it is needed to meet the challenges of loss of pesticides, pest resistance, emerging pests and the public growing concern for safe food and a clean environment. This goal takes a team of people who will be able to do the work and work for the long-term goals of these sustainable projects.

We strongly urge AAFC to fill the vacant population ecologist entomologist, vacant plant pathologist position and now the soon to be vacant nematologist at the Vineland AAFC location as soon as possible in full time capacity.

GINSENG TECHNICAL WORKING GROUP REPORT

EXECUTIVE SUMMARY:

The 2001 season was relatively dry. Many issues concerning diseases could be explained by coverage and timing of control applications. Overall, the crop size was down in 2001 all across North America.

The two diseases that remain of concern to the industry and that limit yield and quality are Rusty Root and Cylindrocarpon. Cylindrocarpon has been linked to the ginseng replant problem. Adequate control of this fungus will stabilize root quality and allow growers to remain on good sites. Rusty root is poorly understood. Ginseng roots respond to environmental and pathogenic stresses by producing phenols and ginsenosides which, in localized areas, generate a rusty scab. Rusty root can be downgraded significantly in the marketplace.

As the industry matures, growers are forced to use sites that are less than adequate for ginseng production. This has led to increased disease and stress problems in gardens.

'Problem' gardens are usually found on poor sites. Site selection is emerging as an important concern for this industry.

STATE OF THE INDUSTRY:

Pest management in ginseng is primarily disease management.

Since June 11, 1996, with the registration of the fungicide Aliette for control of Phytophthora, the ginseng industry has had in place a disease control program that addressed resistance management. The result has been that Ontario growers have not experienced the loss of control of this disease that happened to growers in Wisconsin. In 1996 Wisconsin was the leading producer of ginseng in North America. Since that time production of ginseng in Wisconsin has dropped to approximately 17% of Ontario production. Ontario production has remained stable since 1996. Wisconsin ginseng gardens have continuously lost ground to Phytophthora through fungicide resistance and climate change. Ontario growers apply 2 Phytophthora control products as part of an overall management program and have been careful to utilize all available options. We remain only one step ahead and the balance could quickly shift.

The ginseng industry in 1997 was reporting approximately 125 cases annually of severe Alternaria blight that affected root yield. In 2001 there were 4. An aggressive disease management program adopted by growers has allowed growers to act preventively rather than react to hot spots. The use of Bravo has been integral in this program. There is currently no substitute that would give growers the same 'security'.

Over the past four years, root residues have been used increasingly as a trade barrier. The U.S. has a zero tolerance on Quintozene residues because the product is not registered for use on ginseng in the U.S. This is not a health issue. The WHO has set the ADI for Quintozene and the average person would need to take 700 capsules a day to reach this level. This is an issue that affects many crops. Until zero tolerance, as it is used in the U.S., is either adopted by Canada or dropped by the U.S., Canadian growers are at risk of this type of market interference. In ginseng this has led to the search for a Quintozene replacement. Quadris has been the only product available for Rhizoctonia control and has not yet received URMULE registration for use on ginseng. As a result the industry is faced with the need for repeated requests for Emergency Use on an annual basis.

EMERGING ISSUES:

- 1 HACCP-based production protocols: To improve the quality of Ontario ginseng roots, production practices need to be tied to a HACCP-based system. This will require evaluation of the levels of various chemical contaminants. Organochlorine residues that are monitored by CFIA may not come from pesticides applied to the current crop. This issue may be of particular importance on leased land.

- 2 The incidence of Rusty Root is increasing: It is becoming imperative to identify the environmental causes of Rusty Root in ginseng. Growers need a means of evaluating production practices to reduce the incidence of rusty root.
- 3 Nitrogen, macro/micro nutrients and manure use in ginseng: Research is needed to identify appropriate addition of manure to ginseng sites in the preplant year. Crop removal of N and the impact of other nutrients need to be better understood to make optimum use of these inputs. It is becoming evident that gardens where nutrition is "pushed" experience additional disease problems.
- 4 Site selection: Because of the ginseng replant problem, good sites are becoming more difficult to obtain. Many growers lease land for ginseng production. Soil properties and pesticide residues can have an adverse affect on ginseng root quality.
- 5 Repeated requests for the emergency use of Quadris on ginseng: Until the Quadris URMULE is approved, the ginseng industry will require repeated emergency use permits. This need is market-driven and has a profound impact on marketability of Ontario ginseng roots.
- 6 Potential for scouting through AIMS: The development of a scouting program through AIMS would enable growers to identify problem areas before they spread. To be workable this would need to be coupled with rapid, accurate disease diagnosis.

URMULE PRIORITIES:

1. To pursue the URMULE for Quadris or request another emergency exemption.
2. Seed treatments: Maxim, Ease-out, Dividend
3. Seed disinfectant: Chlorine, Vircon
4. Fungicides: BAS 500 (Cabrio), Actigard, Topaz, Quadris
5. Fungigants: C-100 (Chloropicrin)
6. Weeds: Gramoxone, broadleaf herbicide
7. Slug control: Safer's new product

RESEARCH PRIORITIES FOR 2002:

1. Identification and control of root and seed diseases and rusty root:

The Issue: Loss of quality and yield to root diseases continues to impact profitability. Cylindrocarpon and Rhizoctonia are the two root pathogens that consistently cause economic loss in ginseng. Neither fungus is adequately controlled chemically. Pythium causes seedling losses and currently has no registered control on ginseng. Fungicide residues in roots are being questioned in the marketplace and have been used as trade barriers. In addition to screening trials for efficacy of new, low risk compounds, there needs to be an evaluation of the impact of nutrition and site selection on the incidence and severity of these diseases. Everything possible needs to be done to reduce disease pressure. The incidence of

rusty root in ginseng is increasing and effects of pathogens, environment and nutrients need to be evaluated.

Current Research Activities:

- a) New and existing chemistries are being tested for efficacy against Rhizoctonia and/or Cylindrocarpon. (AAFC)
- b) A field survey of Pythium tolerance to metalaxyl (AAFC)
- c) The association of Cylindrocarpon and Rusty Root (AAFC)
- d) A soil extraction method for detection of Cylindrocarpon (AAFC)
- e) Investigations into the chemistry of rusty root development (U of G)

Current Extension Activities:

- a) Weekly agriphone during the growing season that can be accessed on the internet, by phone, fax or email. Pictures of symptoms are provided and up to date control/prevention practices are discussed.
- b) Growers with serious problems are visited and diagnosis confirmed
- c) Grower trials comparing traditional use of Quintozene and Quadris for Rhizoctonia control were conducted
- d) Cooperation with the OGGA to keep agribusiness and consultants aware of PMRA decisions
- e) Technology transfer (U of G): Controlled temperature, above ground stratification of North American Ginseng seed. Hort Technology 11:100-103, 2001

Gaps and Barriers:

In addition to determining associated pathogens, more research is needed to evaluate the impact of nutrition and site selection on the development and severity of rusty root.

Pythium is increasing in seedling gardens. This may be in part due to climate change or may be a result of more ginseng being grown on land that has had previous Pythium-susceptible crops or metalaxyl-resistant strains may be selected when the product is used for Phytophthora control. There is currently no product registered for use against Pythium in ginseng.

Diagnosis of seedling diseases is often not confirmed and many assumptions are made. This leads to misuse of fungicides and sometimes to the increase of Fusarium and Cylindrocarpon.

An effective seed treatment would reduce the disease pressure in seedling gardens. Seed treatments need to be evaluated using both traditional and above-ground stratification procedures.

Current research is a start in the right direction but needs to be expanded and continued if reduction in disease incidence is to be realized.

RECOMMENDATIONS:

1. Nutrient Management

Background:

Little, if any, information exists for ginseng regarding the effective or efficient use of nutrients including micro and macro nutrients and manure. As growers move onto sites that are less suited to the production of ginseng they are increasingly adding manure and nutrients to "fix" the site. Excessive use of manure in some cases has led to the development of rusty root. Excessive use of boron has led to yield and quality losses on a number of occasions. Until basic recommendations are established growers are at the mercy of all those who would sell them a quick, and often expensive, cure.

Recommendation:

- a) That funding be made available to establish crop removal, and uptake numbers and
- b) That nutrient recommendations be developed that are based on crop needs that address both quality and yield.

Directed to:

AAFC

OMAFRA

2. GLP:

Background:

There are few sites available for use in trials requiring GLP. GLP certified sites are required for minor use trials to collect residue data. The lack of certified sites has made it difficult to proceed with URMULE applications that move the Ontario ginseng industry toward better and lower risk pesticides.

Recommendation:

- a) That financial assistance be made available to establish accessible GLP-certified sites for minor use trials.
- b) That funding be made available to train personnel in GLP certification, coordination and supervision.

Directed to:

AAFC

OMAFRA

3. Rapid diagnostic techniques

Background:

In order to effectively control diseases in ginseng, growers must have ready access to accurate and fast diagnosis of plant diseases. Growers must make costly decisions in a short period of time. Delay in applying control products can cause losses in both yield and quality. Accurate diagnosis is critical in choosing the right control product.

Recommendation:

- a) That funding be made available to establish rapid diagnostic procedures and train staff in their use.
- b) That diagnostic staff be increased during peak growing months to accommodate grower demands for quick turn-around.

Directed to:

OMAFRA, ARD
OMAFRA, Risk Management
U of G Lab Services

4. Pesticide Harmonization:

Background:

Global markets are becoming increasingly competitive, especially for agricultural products. Canadian, and Ontario, farmers have been burdened with the costs of providing a safe workplace, assurance of environmental responsibility and the use of highly regulated products for pest control. It is often to the advantage of competitors in the U.S. that they have access to new, low risk, control products that Canadian and Ontario farmers do not have. By using data collected in the U.S. on the same crop group and in the same crop map zone our farmers would have equal access to new, low risk products. This would increase consumer confidence on Canadian and Ontario produce and strengthen market share.

Recommendation:

That PMRA, through Health Canada, accept crop grouping and harmonize crop mapping with the U.S.

Directed to:

Health Canada
AAFC
PMRA
Environment Canada

5. Canadian Equivalent of IR4

Background:

Minor use registration in the U.S. has been facilitated by the establishment of a body that coordinates data collection and sharing. Canada does not have an organization that functions in this manner. In the U.S. it is independent of government agencies but funded with government dollars. The IR4 has made it possible for growers to access information necessary for minor use registration and to coordinate GLP certified trials for data collection.

Recommendation: That the Canadian equivalent of IR4 be established as an independent, arms-length, organization to assist the agricultural community with minor use submissions.

Directed to:

AAFC
OMAFRA
Health Canada

GREENHOUSE FLORICULTURE TECHNICAL WORKING GROUP

Emerging Issues

- 1) Quarantinable diseases have become an issue for the industry in the last year. Chrysanthemum White Rust (CWR) was discovered in BC greenhouses in the fall, resulting in heavy losses for the industry and individual growers in that province. The Ontario industry came under scrutiny because of earlier sales of cuttings from some of the infected greenhouses to local growers. Inspections by CFIA produced no evidence of the disease in Ontario, however, shipments of chrysanthemums were delayed at the border by USDA as a result of US concerns.

Sudden Oak Death (SOD) is a disease killing large number of coast live oaks, black oaks, Shreve oaks and tan oaks along the pacific coast of California and in Oregon. *Phytophthora ramorum*

has been shown to be the pathogen responsible for this disease. Rhododendron, azalea, huckleberry, maple, red oak are also hosts of this new species of *Phytophthora*. On Nov 14, Flowers Canada was advised that the Canadian Food Inspection Agency had restricted the movement of susceptible oak including oak products, maples, rhododendrons, azalea and huckleberry from regulated areas in California, Oregon, Germany and The Netherlands into Canada. Quarantine remains in place for all areas inside Oregon and California. This situation is beginning to have a significant impact on the Ontario nursery and ornamental flowering plant industries due to restrictions placed on the movement of azalea and other propagating material from the quarantined regions to Ontario.

- 2) Widespread failure of imidacloprid to control whitefly in poinsettia was evident in the greenhouse industry last year. A number of potential reasons for the failure were put forward including: growing conditions, incorrect rates, incorrect application methods and resistance. This year again, control with imidacloprid was less than growers had come to expect up until last year. The difference between this year and last year however, was that growers were more prepared this year. Alternative control products and strategies were used and most growers paid more attention to correct application of imidacloprid. These observations reinforce the suspicion that resistance may be emerging as the cause of the problem, especially given the sudden widespread problems (reported throughout Canada and the north-east US), and the fact that only one species of whitefly (*Bemisia argentifolii*) so far seems to be involved. The other major whitefly species (*Trialeurodes vaporariorum*) still appeared to be well controlled. It should be emphasized that resistance has not actually been documented.

Recommendations

1. Minor Use Pesticide Registrations

The committee continues to express its concern over the apparent lack of commitment by PMRA to seriously address the URMUR aspects of the Minor Use Pesticide program. With industry support in the last 2-3 years, it was felt that excellent progress has been made with new pesticides obtained through URMULE. However, many of the most urgent pesticide needs for the industry can only be addressed through URMUR. The committee feels that the principle behind URMUR is excellent, but that it is not being acted upon by PMRA. This view is reflected by comments from various registrants in the US who have suggested that the process is too onerous in Canada for them to seriously pursue bringing new products into the marketplace here. With the impact of FQPA starting to be felt, the need for new products is becoming increasingly urgent.

The bulk of new products that the industry is seeking under this program are reduced risk (in the US), with high compatibility with natural enemies (a major consideration in the greenhouse industry where biocontrol plays a major role in pest management). Many of the products fall into the microbial category, often manufactured by smaller companies with limited resources. Even with registration fees waived for such products, there is little incentive for these companies

to become involved, since even repackaging from a US to Canadian format can be expensive (\$15000 - \$25000). Efficacy requirements may also be inadequate for the more stringent regulations in Canada compared to the US.

A further concern is the need to address the gap that exists between URMULE and URMUR. There are active ingredients currently registered that are not eligible for either program. For example, an AI may be registered for a use in a formulation not suitable for that needed by the industry. URMULE cannot be used because of the formulation difference. The same AI however, may be registered in an appropriate formulation in the US, but is ineligible under URMUR because the active is already registered in Canada.

Recommendation

That PMRA make a serious commitment to minor use registration in all its aspects. PMRA should in particular address the above concerns to make the program more workable and attractive to companies with products having a novel mode of action (especially microbials). PMRA should also address the current gap existing between URMUR and URMULE, so that potential new products are not lost.

Target Agency

PMRA

2. Quarantinable pests and diseases

The success of Ontario floriculture is heavily based on its ability to compete globally and the strength of its export market. Most of the industry's production is currently exported and it has a positive trade balance with the US. With a perishable commodity such as flowers it is essential that border crossings are free of delays. Even a short delay can compromise the quality of the product. To put the potential impact of border delays into perspective, if the chrysanthemum industry alone were shut down as a result of a real or perceived quarantine issue, it would affect an industry worth approximately \$70 million per year to the Ontario economy. In the past year, several pest/disease issues have arisen that have affected (or have the potential to affect) the export sector of the industry.

- Chrysanthemum White Rust
- Sudden Oak Death
- Insects in cut flowers from South America (already inspected by USDA) delaying shipments of value-added product being exported from Canada to the US

The industry would like to acknowledge and thank CFIA for their professional and timely handling of these issues, and their efforts to allow all interested parties to be a part of discussions where appropriate and to keep them informed of new developments.

Recommendation

It is recommended that:

The Canadian Food Inspection Agency continues to support the industry in border issues falling within its mandate. Task Forces such as that created to deal with the Chrysanthemum White Rust issue, are an excellent means of keeping communication lines open, and should be looked at as a model for future issues. Priority should be given to improving communications with regional US port authorities to expedite resolution of delays and problems.

Target Agencies

- Flowers Canada (Ontario), Flowers Canada
- CFIA

VEGETABLE TECHNICAL WORKING GROUP

Responsibilities

The Vegetable Technical Working Group decided to meet at least once a year to discuss changes to OMAFRA Publication 363 "Vegetable Production Recommendations". The objective of Publication 363 is to provide the industry with the leading edge, most up to date information and recommendations for vegetable production. The Vegetable Technical Working Group is responsible for reviewing and approving pesticide recommendations for OMAFRA Publication 363 "Vegetable Production Recommendations". Supporting data is required for new pesticides and changes to older pesticides regarding efficacy, crop safety, and toxicity. The working group will make requests for data from sponsoring companies and if not provided, decisions will be made based on the expertise in the working group.

When possible pesticides will be ranked based on compatibility with IPM, resistance development, occupational health and safety factors, and affect on the environment and efficacy (not in any particular order).

New products will be included provided they meet the requirements as outlined in the front leaf of Publication 363.

In addition the Working Group will identify crop protection issues and bring these to the attention of the Ontario Pest Management Research and Services Committee (OPMRSC).

The working group decided not to develop research or URMULE priorities since other OASSC subcommittees deal with these issues as they pertain to specific commodity groups.

Minor Use Update

Jim Chaput, Minor Use Coordinator, OMAFRA, Guelph and Craig Hunter, Minor Use Coordinator, OF&VGA, Guelph updated the group on current initiatives in the Minor Use Program.

Issues:

- Few pesticides labeled for use in the greenhouse transplants
- There has been problems getting chemicals registered for greenhouse vegetable transplant production use, even though the product is registered for use in the field. PMRA does not understand what a greenhouse full of transplants translates into on a field scale.
- Active ingredients registered on sugar beets in Ontario must be acceptable to Michigan Sugar and meet Michigan and EPA MRL's.
- PHI differing from the U.S. and Canada – we must recommend the longest
- Tank mixes not registered on sugar beets by the PMRA can not be recommended in Canada even though they are registered in the US and the final product is shipped to the US but consumed by Canadians
- Nothing registered for armyworm control in sugar beets.
- Loss of benomyl will have an impact on the production of many vegetables grown in Ontario since it is sometimes the only registered product for disease control.
- No insecticides registered for flea beetle, leafminer, foliar aphids, leafhoppers, and spider mites control in vegetable transplants.

Recommendation:

- 7 Request from the PMRA to clarify whether or not product registered on greenhouse vegetables also refers to transplant vegetables started in a greenhouse. Registrants need to amend labels regarding transplants.
- 8 Low Acreage Research and Services Committee recommended to look at potential URMULES for sugarbeet and vegetable transplants.

GREENHOUSE VEGETABLES TECHNICAL WORKING GROUP

Tomatoes

Significant pest problems included the following:

- 9 PepMV - First incidence of PepMV in Canada occurred in the fall of 2000 in Essex County. This disease carried over into 2001 and about 34 operations or about 65% of the total tomato acreage in Essex County were affected. Reported losses varied from 0-20%. Symptoms were associated with stress conditions particularly low light levels and fungicide applications.
- 10 Potato psyllids - First report of this aphid-like pest in Ontario occurred early summer. It was reported to have affected only 3 operations and losses were minimal.
- 11 Tomato bug or *Engytatus modestus* - First report of this pest in Canada occurred in Essex County in late summer. Damage by this pest directly affected yield due to feeding pattern. Shoots, flowers and entire inflorescences can be cut off. By early fall, it was estimated that

about 36 operations were affected. Speculation about entry of this pest into Ontario via Georgia field transplants is not likely, given that inspection some of these fields yielded no evidence of the presence of populations during the summer period, and that growers of processing tomatoes apply a pesticide known to be effective against this bug, soon after transplanting.

- 12 Diseases – There were incidences of bacterial canker, botrytis and corky root rot. Incidence of pith necrosis also increased. Of significance was wilting, particularly in Rapsodie, the cause of which could not be ascertained by various labs.

The occurrence of the number of new pests within 1 year in Ontario demands answers to the method of import of these pests.

Cucumbers

Major problems for this crop were as follows:

8. Significant crop losses due to CMV in fall crops. Eleven operations at least were infected and one operation reported 27% plant loss. Weather related increased incidence of aphids were the cause of this. Symptoms varied among different operations. Fortunately, one CMV-tolerant variety, Gardon staved off serious symptoms due to this virus.
9. Pythium caused significant plant loss in some fall crops at the transplant stage depending on timing of planting. Hot weather at the time of transplanting favoured incidence of this root disease. Up to 30% plant loss in 1 operation was attributed to this disease.
10. There were at least 3 incidence of Fusarium root and crown rot this year. It's likely that more growers may have been affected because symptoms of this disease may be confused with those of gummy stem blight or Pythium root rot. This disease has persisted in at least 1 operation for 3 years and caused significant economic losses this year.
11. Powdery mildew remains the prime concern of all cucumber growers. There is demand for new effective, non-phytotoxic products or strategies.

Positive reports of the cucumber industry is a slight increase in the acreage adopting biological control which is now about 27% and perhaps a trend towards accepting biological control. For 2002, 2 new operations will try BC, and in 2003, another large operation is preparing to do same. About 43% in total are using IPM techniques i.e. primarily carrying out scouting to determine pesticide applications. Obstacles to more rapid adoption biological controls include Beet pseudo yellows virus, cost of biological control, lygus bugs, cucumber beetles.

Pepper

Major pest problems for pepper crops were as follows:

12. European corn borer – losses were significant in some operations estimated at \$6,000 per acre at one operation.
13. Lygus bug – no adequate controls exist for this pest.
14. Although not a problem, the silver leaf whitefly was identified in one pepper crop and this could signal a threat to cucumber and tomato crops.

Powdery mildew was generally well controlled and no major losses due to Fusarium were reported.

Major Activities

4. New Pests – assisted in the identification of PepMV, potato psyllids, and tomato bug, and in provision of information on these pests to growers through meetings and information sheets.

5. Product Registration Activities

- Emergency registration of Ridomil Gold for cucumbers
- Worked with Les in GLP residue trials for Floramite on cucumber and pepper
- Worked with Ray to obtain a research permit for Stylet Oil for spider mite and powdery mildew
- Working with Les on residue trial for pirimor for aphids on tomato
- Worked with Barb in obtaining a PHI reduction from 3 to 1 day in Impower
- Working with Ray to obtain a registration for Sulphur on pepper
- Continuing to investigate many new products.
- Working with Les on screening trial for Lygus bug.
- Worked with Barb on some products for Pythium

Major Concerns

15. Lack of measures in place to prevent importing and spread of new pests and diseases.
15. Obstacles brought on by PMRA, usually for more data, for reduced risk products that are often already registered for use on greenhouse crops in the US eg. Rootshield, Attract & Kill for loopers, Aza-Direct.
16. No category exists for reduced risk products such as those above except when they are being reviewed jointly with the US. That is, waiver of data and reduced costs of registration needed.
17. Increased funding is necessary for minor uses, particularly for food crops. This is due to the increased cost associated with residue trials done under GLP.
18. There is need for increased support for more efficient diagnostic techniques at Guelph Lab. Good support for diagnostic services was generally provided by the Pest Diagnostic Lab in Guelph. However, sometimes results were delayed because of lack of resources for virus identification.

Priorities for Minor Use Registration

Insecticides and Acaricides:

- 20. Conserve (spinosad) for thrips and caterpillars
- 19. Distance (pyriproxyfen) for whiteflies
- 20. Floramite (bifenazate) for spider mites
- 21. Assail (acetamiprid) for whiteflies and true bugs
- 22. Endeavour (pymetrozine) for aphids and true bugs
- 23. Aza-Direct (azadirachtin) general suppressant for insect pests

Fungicides:

- 24. Sovran (kresoxim-methyl) for mildew, particularly in cucumber
- 25. Decree (fenhexamid) for botrytis generally
- 26. Ridomil Gold (metalaxyl) for pythium in cucumber
- 27. Previcur (propamocarb) for pythium in tomato and pepper
- 28. Medallion (fludioxinil) for Fusarium in pepper and cucumber
- 29. Stylet Oil for mildew (initially on pepper and tomatoes; data pending for cucumber)

RESEARCH PRIORITIES AND RECOMMENDATIONS FORWARDED FROM THE FIELD CROPS AND HORTICULTURAL CROPS COMMITTEES

Pest Management Research Priorities From OFCRSC - 2001

Emerging Pest Issues

Lindane. PMRA is definitely going to pull lindane from the market place. This puts seedcorn maggot and wireworm control in corn and beans in question. Lindane is the only option. After meeting with Wendy Sexsmith, we got the impression that PMRA would allow one more season of use. Helix, Cruiser and Gaucho are all viable alternatives for both pests, however, they are not currently registered on corn or soybeans. A minimum review of 18 mos through PMRA for a minor use, would require us to submit a minor use application for at least one of these now to get registration in time for 2003. Jim Chaput is in charge of minor use for OMAFRA and OCPA and OSG should co-champion the application. We have data for both pests to support, but the big question is residue data. This application should fit the minor pest in major crop scenario and fall under URMULE.

European Chafer. Areas affected still range in the thousands of hectares, but the infestation did not seem as bad in intensity as the year previous. Chafer populations were sporadic and unpredictable, in some cases high populations measured in the fall crashed over winter. There are no products registered for chafer in wheat and corn. Some progress in finding products has been made but a fully satisfactory solution is not yet available. Michigan and Ohio are reporting similar problems but not to the same extent that we have. When populations are high, tend to spread Milky spore disease, for which we saw some evidence in late summer with the rains finally arriving. If the turf experience is any indication of how this pest will behave in field crops, this pest has serious cyclical potential for harm. The egg laying behaviour in soybeans needs to be studied to perhaps find a weakness for control. Other priorities included forecasting and sampling, threshold work – avoidance, efficacy work on insecticides as seed treatments or in-furrow applications. Little is known about cultural eg. tillage, delayed planting.

A longer term approach might be biocontrol via *Bacillus* Biocontrol.

Soybean Aphids. Aphids to varying degrees could be found in almost every soybean field in Ontario. Only those fields west of Toronto experienced economic loss. Rough estimates for those fields west of Toronto was that there was only half a soybean crop and half of that loss was attributed to aphids and half was attributed to the drought alone. Some estimates put the loss at about \$50 million due to aphids. Certainly the two went hand in hand and there were other contributing factors to the losses such as soybean cyst nematode. Some fields that had adequate moisture had respectable yields despite the presence of high numbers of aphids. In hindsight under the drought it might have been useful to have sprayed more fields. However, under adequate moisture the US in 2000 (the first year of north American experience with this insect) showed little to no value to spraying. Another serious concern is the transmission of soybean mosaic viruses by these aphids. Indeed the prevalence of discoloured seed because of SBMV was exceptionally high this year, by industry reports. Sooty mold was also prevalent on infested plants as a secondary problem to the aphids. Although it was obvious there was a yield impact due to sooty mold it was difficult to separate out the loss.

A consortium of public researchers is putting together a joint research proposal and action plan in Ontario. Several control options are being investigated. We have only one insecticide registered, dimethoate, an organophosphate. It is a troubling thought to have

thousands of hectares treated with this material next year. Matador, a much safer option, is the next nearest contender but it would require a label extension taking a minimum of 18 mos. Seed treatments including the newer nicotinyls are being investigated. We do not know enough about how effective ladybugs are in aphid control and how they interact with insecticides.

Extensive Stink bug damage to food grade soybeans destined for Asian markets was also noted for the first time in Ontario. Up to 15-20% pick was noted this year in many beans samples. It is uncertain why they were a problem, but their high numbers were coincidental with the presence of aphids. Whether they were there because of the ladybugs and/or aphids is uncertain.

Bean Leaf Beetle. Only a few causes of this pest were noted this year, which is a drop from the previous year. Infestations seem to be related to survival after mild winters. The main concern is the potential for transmission of Bean Pod Mottle Virus. If it is found to vector this disease in Ontario then this pest will need to be controlled.

Grey Leaf Spot in corn – Reports of seed companies finding this disease this year were confirmed by AAFC, OMAFRA, U of Guelph. It was found at very low incidence. This disease has caused serious harm in the US corn belt. Tilt is in the publication already for this disease. Quadris minor use package for seed corn went in. The resistance of hybrids used in Ontario is questionable, because this disease was not a priority in breeding programs. Predictive measures need to be developed along with control thresholds.

Rust - same concerns as Grey Leaf Spot

Fusarium in wheat – Folicur is up for one more emergency registration. Application to go in February. PMRA is leaving some doors open for fast tracking a review in time for full or temporary registration in 2003.

Rhizoctonia/Pythium/Phytophthora complex It was noted that these diseases are increasingly becoming a concern. An Ont. survey showed that Pythium was the most common disease this year. APRON seed treatment, and other products are applied commercially, by certified seed producers. We don't have products for the grower to apply on farm, only a small percentage of soybean seed is treated commercially. On farm treating is a more realistic objective for the companies to go for.

Western corn rootworm. There is some evidence that the soybean variant troubling Indiana/Illinois producers is in Ontario, but so far at a very low, non-economic level and frequency. It is still difficult to say if this new pest will become economic in Ontario.

Field Crop Protection Committee Research Priorities High Priority Pests Requiring Immediate Research - Ranked

- 13 Soybean Aphid: Economic impact (thresholds), Management, Chemical controls, efficacy and non-targets, Plant breeding, Biology, life cycle, overwintering, sooty mold relationship, Relationship with other insects, Vectoring viruses
- 14 European Chafer: Decision Thresholds, Scouting monitoring predicting, Biology, Control measures: Chemical, Cultural & Biological

- 15 Fusarium: Resistance breeding, New chemistry, Grading system wheat- inconsistent
- 16 Soybean Cyst Nematode: Population dynamics -Race shifts, Spread of SCN, Management
- 5 **Corn Rootworm:** Risk assessment for soybean variant in Ontario
- 6 **White Mold:** Resistance, Management - New products to replace lost chemicals
- 7 **Root Rots:** (Pythium, Phytophthora, Rhizoctonia, Fusarium), Thresholds, Better management tools Biology
- 30. Corn Stalk Rots: (Anthracnose, Fusarium, Gibberella) Implications of cropping systems to disease, Management
- 31. Alfalfa Weevil: Survey to determine status of Biological control agents – why they haven't been effective lately.
- 32. Cereal Leaf Beetle: Survey to determine status of Biological control agents – why they haven't been effective lately.

Other Pests of Concern for Ontario Agriculture:

- Tarnish Plant Bug in edible beans
- Anthracnose in edible beans
- Potato Leafhopper
- European corn borer
- Corn leaf diseases
- Slugs in soybeans and corn
- Bean Leaf Beetle
- Lygus in alfalfa and canola

Objectives for the Committee for 2001-2002

- 33. Folicur registration
- 34. Chemical options for Soybean Aphids
- 35. Sorting out impact, seed quality, pest complex of soybean aphids
- 36. Sort out resistance management strategy for new transgenics (i.e. CRW)
- 37. Stewart's Wilt/Flea Beetle management for seed corn
- 38. Keeping track of emerging and cyclic pest issues (i.e. aphids, chafer, grey leafspot, stewart's wilt, rust etc.)

- 39. Minor use applications
- 40. Revise Pub 812

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